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FILE # 10197

original with Mary

IAD/OSS-256/66
23 November 1966

MEMORANDUM FOR: Assistant for Technical Development, NPIC

ATTENTION : [] Development Staff

FROM : Chief, Imagery Analysis Division, CIA

SUBJECT : Proposed Automatic Viewgraph Generator

REFERENCE : [] Technical Proposal
Number 66-3560-2, dated 2 November 1966

1. The Imagery Analysis Division was pleased to have an opportunity to review [] proposal for development of an Automatic Viewgraph Generator.

2. As you are aware, the IAD is often faced with high priority requirements requiring rapid response, an Automatic Viewgraph Generator would greatly facilitate handling such requirements. It is anticipated that this device would make a significant contribution toward increasing this division's rapid response capabilities. The capability of rapidly producing, at low cost, viewgraphs "in-house" should be of prime benefit to our efforts in support of JCI (following each mission) and to our many requirements for high priority briefings on short notice.

3. An Automatic Viewgraph Generator would fill a presently existing gap in the family of "in-house", "quick and dirty", reproduction devices presently used in IAD; such as the RIPP, the Photogrammetry Quick Copy Cameras, the [] Photo-Micrographic Enlargers, the MP3 polaroid Lantern Slide generation capability, and the [] PI Rapid Copy Viewer/Printer presently under consideration. The numerous staff studies and cost/effectiveness analyses made by IAD to support the concept of "in-house" graphics preparation provide a background of information against which we have evaluated this proposal; concluding that such a device would not only increase our operational effectiveness, but would offer significant manpower and operating cost reductions.

Declass Review by NGA.

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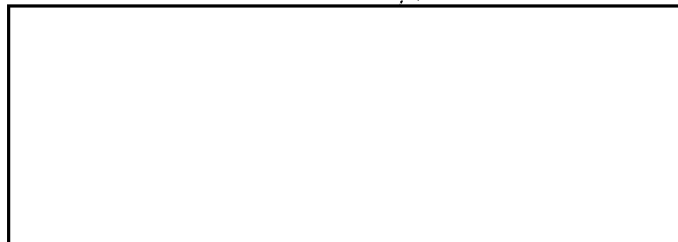
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X1 4. In light of the above comments, the Imagery Analysis Division feels that it would be prudent to accept the [] offer to construct two of these devices simultaneously. We feel that this development is on firm technical footing with a relatively low risk of failure; since this device is, in all honesty, a modification of existing and successful shelf hardware. We feel that our operational requirement for this device more than justifies the expenditure of an additional [] to procure two units (one for PD and one for IAD) rather than one. 25X

5. The Imagery Analysis Division is appreciative of past efforts of your staff which have resulted in many of our "in-house" capabilities, and feel that your efforts on our behalf in this development project will lead to equally successful results. 25X

Distribution

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2 - OSS/IAD



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125213

<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>
125223	Case	2
125229	Holder	4
125230	Spring Plate	4
125228	Plate	8

115704

115708	Rack	5
125204P1	Strip	8
125204P2	Strip	8
	Bellows	2

115705

125208	Mirror Stop	2
115749	Hub	2
115743	Hub Assy.	2
115738P1	Shaft	1
115738P2	Shaft	1
125206	Toggle	2
X18-N	Ball Plunger	6
B-3	Plastic Cont.Ball Handle	2
125210	Bottom Plate	2
125211	Top Plate	2
125212	Rod	2
125219	Retainer Seal	8
AY-9	Spring	6

115706

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<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>
115721	Shaft	2
115715	Sleeve	6
G-41-24	Gear	6
1C1C2	Thermostat	2
CI3	Collar	2
115741G1	Roller	4
125214	Space Angle	4
125215	Finish Spacer Rod	4
125216	Roller (Metal)	4
125217	Roller (Rubber)	4

115707

115729	Transport Plate	4
115724	Spacer Shaft	2
FB57-3	Bearing	18
G41-24	Gear	2
NSH-33R-10-1	Motor (Bodine)	2
SH-34	Motor Control	2
SFC-100	Electric Coupling	2

125231

8314440	Three Way Valve	1
1/2 X 1/6 wall	Tygon Tubing	20 ft.

<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>
GFL-940	Light Table	2
77313-A	Complete Elevator Assy.	2
77224-01	Case	2
77224-02	Case	2
76871-01	Insides	2
76871-02	Insides	2
74791	Bracket	4 3
74858	Bracket	8
14"	Consute Processor	1
8 1/2 X 11	Junior Dispenser	1
58661	Magazine Assy.	2
78814	Frame	2
76936-02	Control Stand	2
76925-A	Arm Assy.	4
76866-A	Lights	12
	Schneider Lens	2
Type 5FS	Compar Shutter	2
91888	Quartz Bulb	8
58521-A	Circuit Breaker Boxes Comp.	2
76509-A	Splice	2
E-1634	Terminal	6 2
58111	Paper Comp. Door Hinge Assy.	4
98717	Magazine Front Cover	2

<u>Part No.</u>	<u>Description</u>	<u>Quantity</u>
9181	Leveling Screws	12
78553	Receptacle	2
78523-A	Receptacle	2
58509		2
92764		4
E-1059		4
77185		4
F71726	Hinge	1
	Dust	1
58401-A	Control Switch	2

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20 February 1969

AUTOMATIC VIEWGRAPH GENERATOR - STAFF STUDY

1. PROBLEM

During calendar year 1967, approximately 5,000 film positives were produced in the Photo Lab for incorporation into viewgraphs. Priority handling by the Photo Lab was often necessary to meet the close deadlines requested. A device was needed that could rapidly produce positive to positive transparencies of suitable size from transparent or opaque originals. It was theorized that this device would expedite the preparation of these viewgraphs, that it would reduce the man-hours of processing time in the Photo Lab, and that it could reduce the overtime hours required in the Visual Aids Unit.

2. HISTORICAL BACKGROUND

On 13 April 1967, a cost plus incentive fee contract was signed with the [] company to produce two Automatic Viewgraph Generators for a total cost of []. The period of performance was to be from 13 April 1967 to 14 August 1967. In August 1967, after [] indicated an overrun on this project, it was decided that in order to reduce overall costs, only one Automatic Viewgraph Generator would be completed--for an overrun on the contract of []. In subsequent negotiations, [] indicated another [] would be required to complete the one unit. This overrun was reluctantly approved and the total amount of the contract was amended to [] for one Viewgraph Generator and the period of performance was extended to 28 February 1969. In late November, 1968, [] informed the Government that additional funding would be required to complete the unit. In December, a stop work order was issued and all work on the project was brought to a halt.

While [] has been reluctant to discuss their internal problems, it appears from collateral information obtained that some of their difficulties on this project have stemmed from: (1) problems in developing the diffusion transfer process, (2) inconsistent properties of the diffusion transfer material as furnished by the manufacturer, (3) management problems, (4) inadequacies in cost accounting procedures, and (5) loss of continuity on the project due to transfer of key personnel.

3. PRESENT SITUATION

[] They estimate that another [] will be needed to complete the work. The total cost of the contract would thus be [] exclusive of fee and, even with this increase, there is still no assurance that there would not be an additional overrun or overruns.

Excluded from automatic
downgrading and
declassification

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4. ALTERNATIVES

Alternatives for the development of an Automatic Viewgraph Generator are:

4.1. Continue the Contract with [] has demonstrated poor management and technical performance on this project to date; there is no valid reason to believe that the situation will improve if we continued.

4.2. Terminate the [] Contract and Negotiate New Contract with Another Company - Proposals from other companies could be obtained for the development of an Automatic Viewgraph Generator. The use of materials other than the diffusion transfer material would have to be considered.

4.3. Terminate the [] Contract and Arrange for Another Company to Complete the Unfinished Work - The work performed by [] so far has been highly fragmentary; however, some components do exist and it may be possible that another company could complete the design and fabrication of the Viewgraph Generator.

4.4. Terminate [] Contract and Complete Project In-House - The use of dry silver materials would be considered if this project were to be completed in-house. However, the positive to positive dry silver transparency material is still in the development stage and design of the equipment at this time would be premature; furthermore, DED is not organized nor staffed to do developments of this size.

4.5. Terminate [] Contract and Renew Project in the Future - Several dry photographic processes including the 3-M dry silver process are being developed. Assuming the requirement still exists in the future, this project should be renewed when one of these processes prove applicable to production use.

5. CONCLUSIONS AND RECOMMENDATIONS

[] has failed to demonstrate technical proficiency or financial responsibility with regard to this project. They have spent considerable time and funds and have little to show for this expenditure. Any further work with [] is definitely not recommended. Alternative 4.2 (negotiating a new contract with another company) is not recommended at this time since no other company has demonstrated the ability to reliably produce positive to positive continuous tone transparencies. Alternative 4.3 (another company complete the [] work) is not recommended. This approach normally ends up being more expensive and less successful technically than if the new company originated the project. Furthermore, the problems associated with the diffusion transfer material would still exist. Alternative 4.4 (performing work in-house) is risky since it proposes using a material which is experimental in nature. Also, facilities for in-house development of this size at NPIC

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are very limited. Alternative 4.5 (renew the project in the future) suggests waiting for further developments in the field of reproduction materials. This approach is recommended since it involves the least amount of risk both technically and with regard to funds. While it is bound to produce some delay in the final acquisition of the desired equipment, this delay is preferable to another false start on an undeveloped process.

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VIEWGRAPH GENERATION DEVICE

General Configuration

25X1 The general configuration of the Automatic Viewgraph Generator will resemble that of the ☐ 10-15 Platemaster, the modification of which will definitely satisfy the Viewgraph Maker requirements. The input material will be positioned on a horizontal platen and an overhead lens and mirror system will project the image onto the Printer/Processor negative platen. Vertical adjustment of the input platen and horizontal adjustment of the lens will provide the necessary conjugate distance adjustments for a reduction range from 1:1 to 4:1 using input format sizes varying from 8" x 10" to 32" x 40". 4.1

25X1 The main console will house the ☐ Processor drive system, processing bath, chemical supplies, and lamp power supplies. The upper console will house the negative film platen and supply spool. The negative film will be cassette-spoiled for daylight loading with 250 feet of 9 1/2" film. The positive film will be inserted in a chute located at the rear of the main console and the processed positive-negative lamination will be delivered to a chute located above the input chute.

The control panel will be located on the side of the main console and provide both projector and processor control functions.

Automatic Viewgraph Maker Operation

The operation of the Viewgraph Maker has been planned so as to preclude the necessity for photographically-trained personnel for producing high quality positive film copies. The basic operation will be as follows: (1) set up the art work on the input platen using the location markings. (2) set the lens and table height controls for the proper input format size, (3) insert one sheet of Anken positive film in the input film chute, (4) depress the exposure switch,

(5) wait one minute then remove the positive-negative lamination from the output storage tray, (6) separate and discard the negative.

25X1 Processor

25X1 The Processor unit consists of a light sensitive negative film supply and exposure platen, chemical bath, drive system, positive film feed chute, and output chute. The operation of the Processor automatically starts upon completion of the exposure cycle, at which time the drive system advances the exposed film through a pair of metering rollers located near the cut-off knife. After advancing the negative eleven (11) inches, the metering rollers stop, triggering the cut-off knife solenoid. The cut negative then enters the chemical bath where it is laminated with the positive film and delivered to the output storage tray. After one (1) minute storage time, the operator can remove the laminated sheets and manually separate and discard the negative.

Mechanical Design Modifications

The main console will be modified to accept the Processor drive system, 25X1 consisting of a set of metering drive rollers and an automatic cut-off knife for the negative film, and a cut-film positive input chute with provisions for automatic synchronization of the positive and negative films prior to entering the processing bath.

The input platen will be modified to include a light table for photographically reducing negative film requiring back-lighting. The light table will contain fiducial marks for locating the input materials as well as providing size information for the table height and lens position determination. Manually adjustable light masks will be used for light table operation.

Automatic table and lens positioning will be provided by two controls located at the input station. Both controls will be labelled as to input format size.

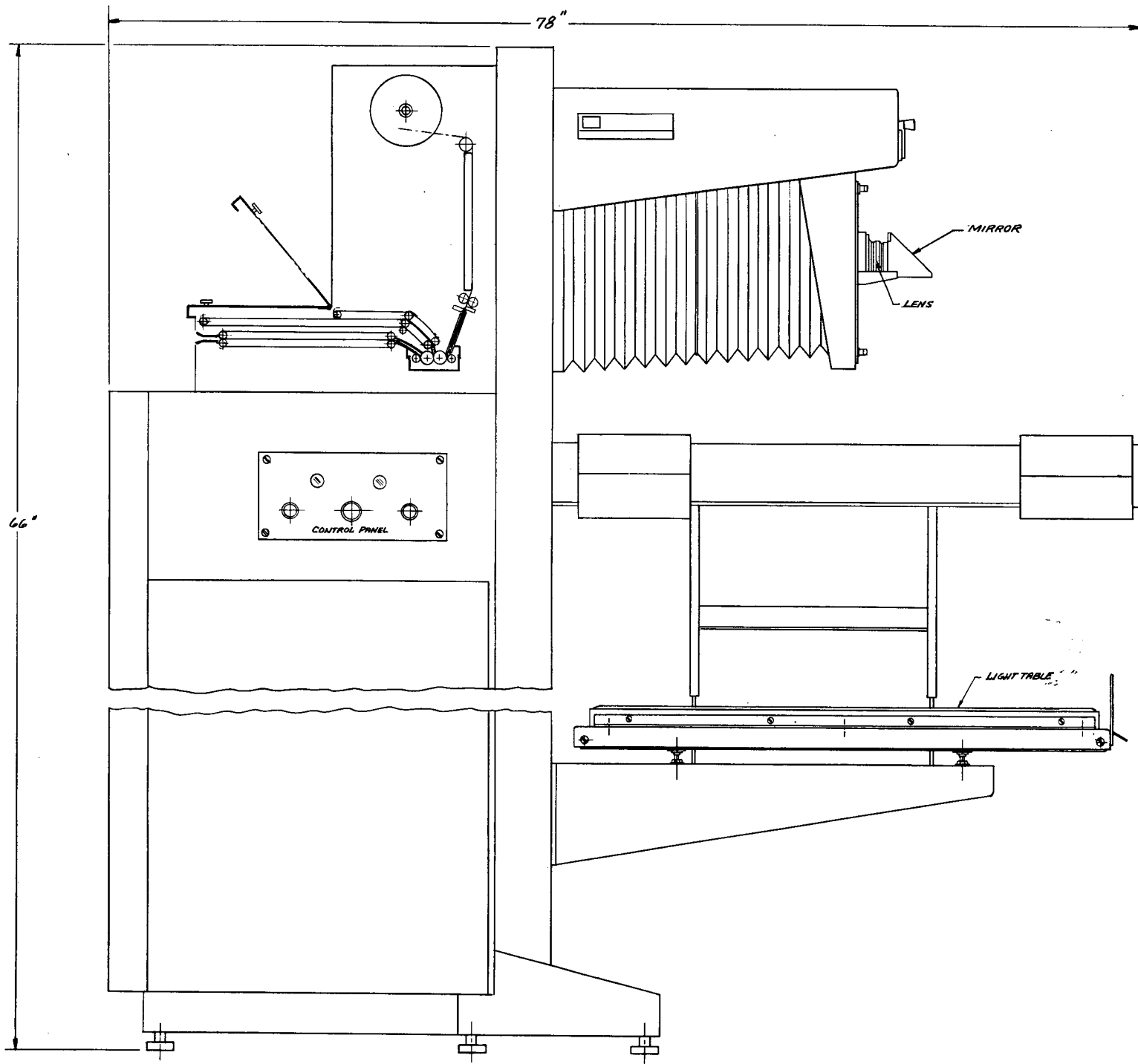
Photographic Considerations

The Automatic Viewgraph Generator will be equipped with a lens and mirror system different from that used in the Itek 10-15 Platemaster because of the 1:4 reduction ratio requirement. The Platemaster lens system can give the required ratio, but at the expense of an unnecessarily large machine configuration. The specific problem area is the vertical adjustment of the input platen. The Platemaster lens is a 15" F.L. Wollensak with a conjugate distance from lens to input platen (for 1:4 reduction) of 75". The Platemaster has a reduction ratio requirement of only 1:2 for which purpose the 15" F.L. lens provides a satisfactory conjugate distance from lens to input platen of only 45".

25X1 Preliminary indications are that the Automatic Viewgraph Generator design will incorporate a 10" F.L. lens, providing high quality performance while maintaining a lens to input platen maximum conjugate distance on only 50". The use of this lens will minimize the mechanical structure redesign while satisfying the 1:4 reduction ratio requirement.

The large light table required at the input platen should pose no serious design problems. Modification of a or similar high quality light table, will provide uniform illumination over the input platen for negative film reduction.

25X1



AUTOMATIC VIEWGRAPH GENERATOR